REMARKS

In the final office action mailed on January 27, 2005, claims 11 and 12 are rejected under §112, ¶1 on the grounds that there is insuf ficient disclosure in the application to support these claims; claims 1 and 2 are rejected under 35 U.S.C. §103(a) over U.S. Patent No. 5,900,637 (to Smith), in view of U.S. Patent No. 6,046,859 (to Raj), claims 3 - 6 are rejected under §103(a) over Smith and Raj in view of U.S. Patent No. 6,133,986 (to Johnson) and claims 7 and 8 are rejected under §103(a) over Smith, Raj and Johnson in view of the Kipp et al. article titled "Sharper Images by focusing soft x-rays with photon sieves" in Nature, vol.414, pages 184-188. Claims 9, 10 and 13 are indicated as being allowable if re-written in independent form; and claim 14 is allowed.

With regard to the rejections under §112, ¶1, applicant again respectfully submits that claim 11 and 12 are allowable. The specification admittedly provides a teaching of how to make *at least one* system of claims 11 and 12. In particular, at least the embodiment of allowable dependent claim 13, (which depends from and is within the scope of each of claims 11 and 12) is enabled. It cannot be stated, therefore, that *no embodiments* within the scope of the claims is enabled.

Moreover, the specification states that the prior art discloses focusing efficiencie of 10% to 40% (Specification, page 2, lines 4 - 8). In the detailed description of the illustrated embodiment, the specification then discloses the use of blazed Fresnel zone plates on at least pages 5 - 9 with reference to Figures 1A - 5, and states, in part:

> The use of an array of such blazed Fresnel zone plates provides an improved lithographic system that may achieve very high first-order focusing efficiencies (e.g., at least 50%) for energies that are not strongly absorbed by the zone plates themselves.

Specification, page 6, line 20 - page 7, line 1.

The specification further discloses the use of apodized Fresnel zone plates at least on pages 9 - 14 with reference to Figures 6 - 12, and discloses the use of photon sieves at least on pages 14 - 21 with reference to Figures 13 - 16. The diffraction efficiency of apodized Fresnel zone plates is discussed at least on pages 13 and 14 of the application with reference to Figures 10 - 12, (which show the efficiency of a Gaussian apodizer as a function of width as well as the effect of width on diffraction efficiency and side lobe distribution). The diffraction efficiency of photon sieves is discussed at least on pages 16 - 18 with reference to Figure 16, (which shows the efficiency of transmission of an amplitude photon sieve). Each of these diffractive elements is also disclosed to be formed as a phase element (e.g., Fresnel phase plate, apodized Fresnel phase plate, and phase-photon sieve) in certain embodiments. Such phase elements may be 100% transmissive as disclosed. Several examples, therefore, of embodiments of the subject matter of each of claims 11 and 12 are therefore, disclosed in satisfaction of 35 U.S.C. §112, ¶1.

The above embodiments and disclosed relationships between efficiency and other characteristics of the diffractive elements, as well as the disclosure of the use of phase diffractive elements, are respectfully submitted to provide a disclosure that does not require undue experimentation. Allowable claim 13 requires that the diffractive elements are alternating phase photon sieves, new claim 15 requires that the diffractive elements are blazed

Fresnel zone plates, and new claim 16 requires that the diffractive elements are apodized Fresnel zone plates. Each of these embodiments of claim 11 is, therefore clearly fully disclosed in satisfaction of 35 U.S.C. §112, ¶1.

Applicants respectfully request, therefore, that the rejection of claims 11 and 12 under §112, ¶1 be withdrawn.

With regard to claim 3, none of the Smith reference, the Raj reference, nor the Johnson reference discloses an array of apodized diffractive elements. The Johnson reference disclosed that it seeks to imitate the effect of apodizing at a single projection lens by providing a tapered profile of a beam at an aperture to provide an "effective apodizer" (Johnson, col. 11, lines 34 - 52). Such a tapered profile of an aperture could not be employed to achieve the type apodization achieved in the present invention, and it is not at all clear how one would even employ such a feature in a system that includes an array of focusing elements. Claim 3 requires, in part, an array of apodized diffractive elements. Applicant submits, therefore, that for at least this reason alone the rejection of claim 13 should be withdrawn.

New claim 17 includes the limitations of claims 3, 7 and 9, and is therefore submitted to also be in condition for allowance.

Each of claims 3 - 15 is, therefore, considered to be in condition for allowance.

Favorable action consistent with the above is respectfully requested.

Respectfully submitted,

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